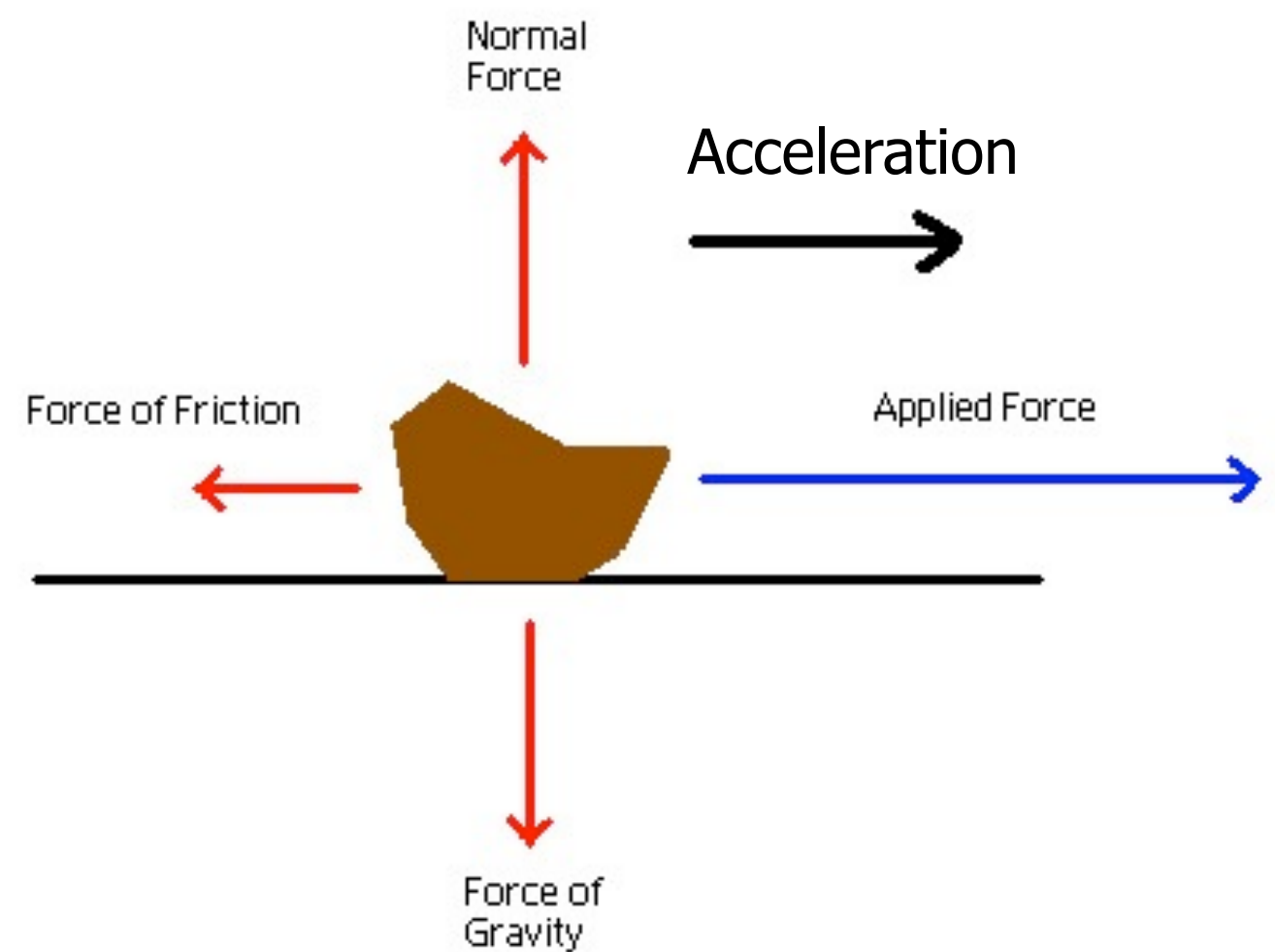
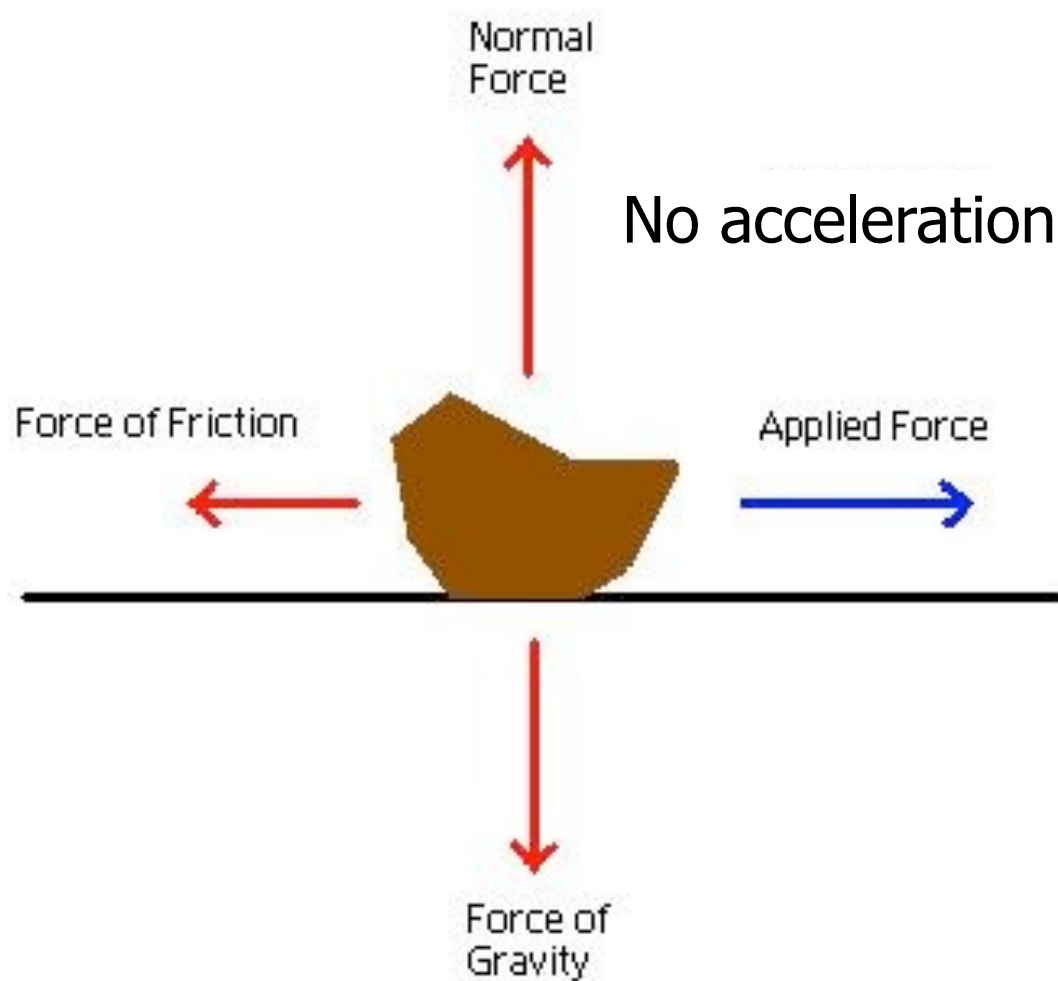


Motion and Forces

Physical Science



- **Force- push or pull that one object exerts on another**

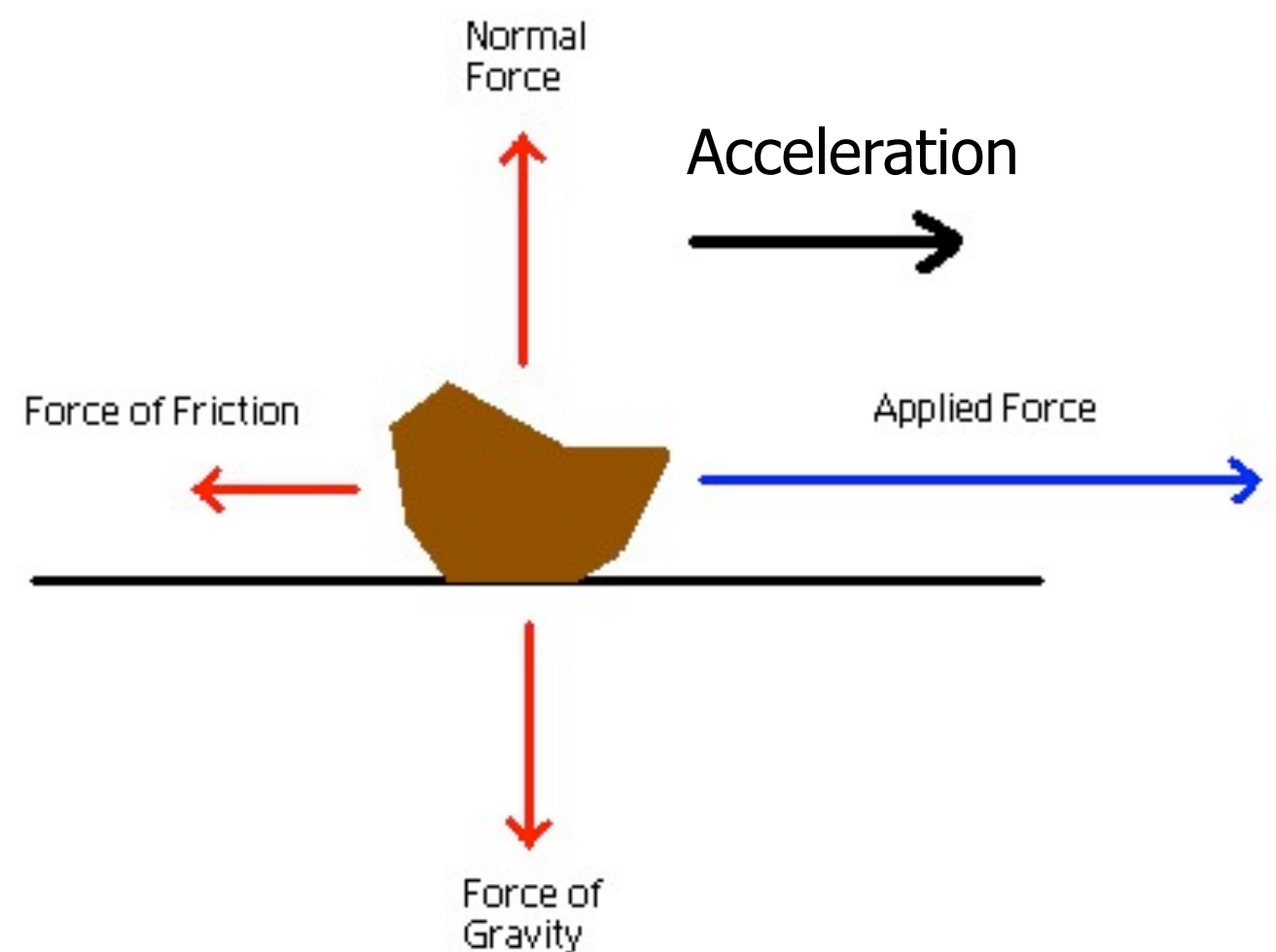
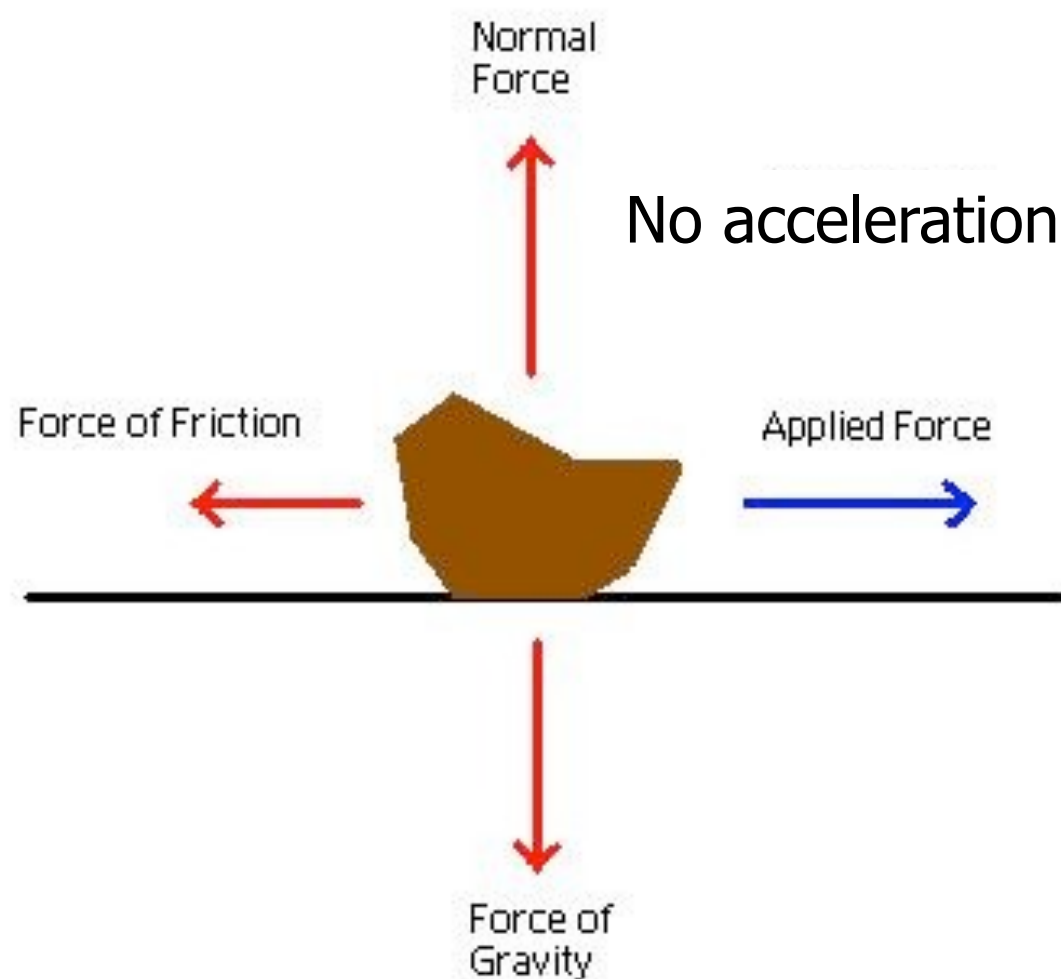
- Examples: hitting a baseball, throwing a basketball, etc.

- **Forces aren't always noticeable**

- Floor pushes up on you- otherwise you'd fall

- **Forces influence motion**

- Changes the velocity- either the speed or direction



Forces

The forces on the person
are balanced.



II. Inertia- an object's resistance to a change in motion

A. If moving; stays moving

B. If stopped; stays stopped



III. Newton's 1st Law: Objects will stay in constant motion, or at rest, unless acted on by a NET force.

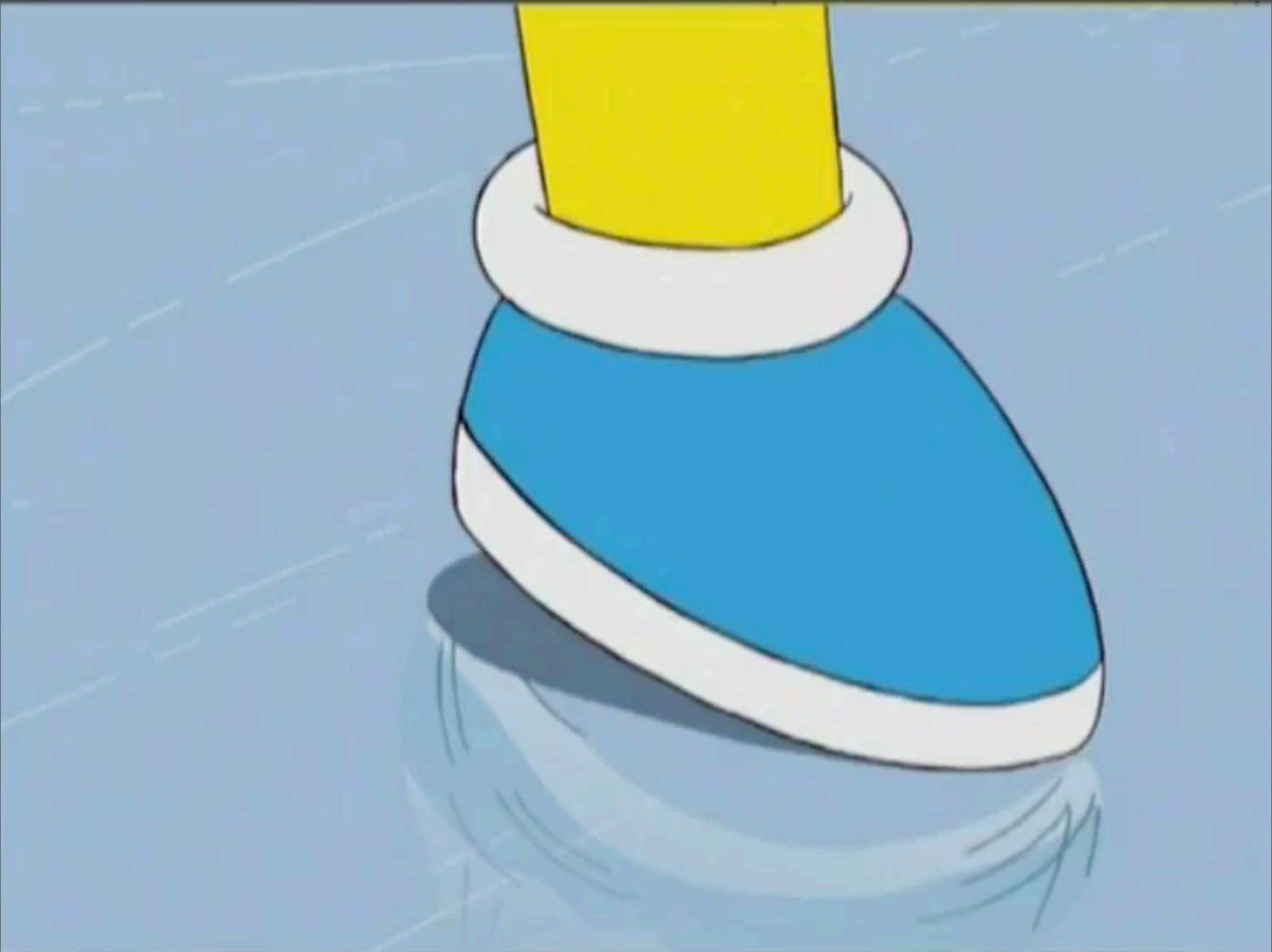
A. Known as the law of inertia

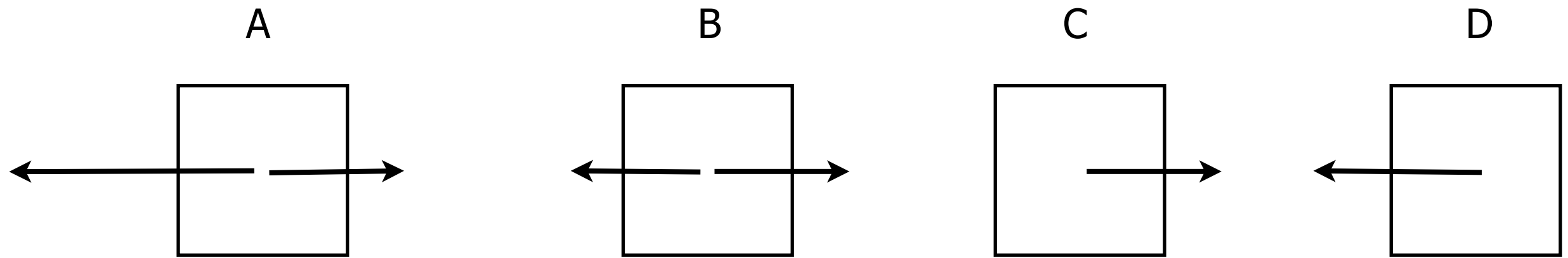












Which diagram above shows a force diagram for a car traveling at a constant velocity to the right.

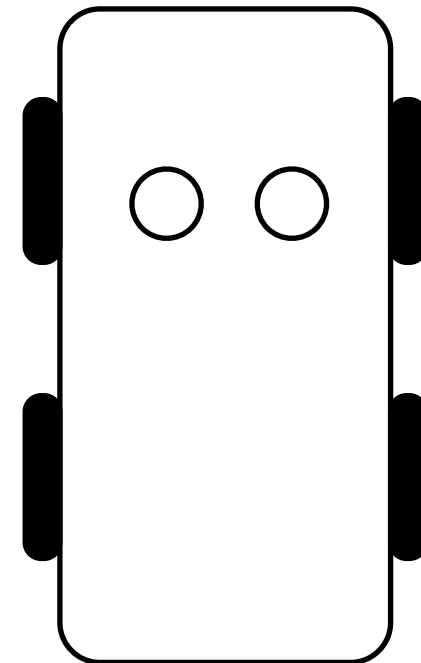
What device was added to cars to help protect passengers for when a car takes off at a green light?

A. Head Rest

B. Air Bag

C. Seat Belt

D. Steering Wheel



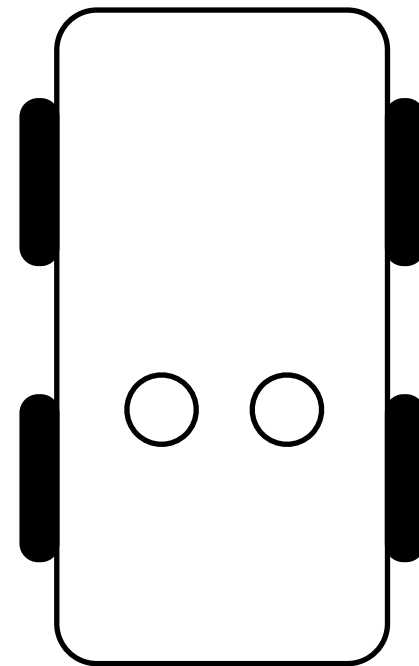
What device was added to cars to help protect passengers for when a car takes off at a green light?

A. Head Rest

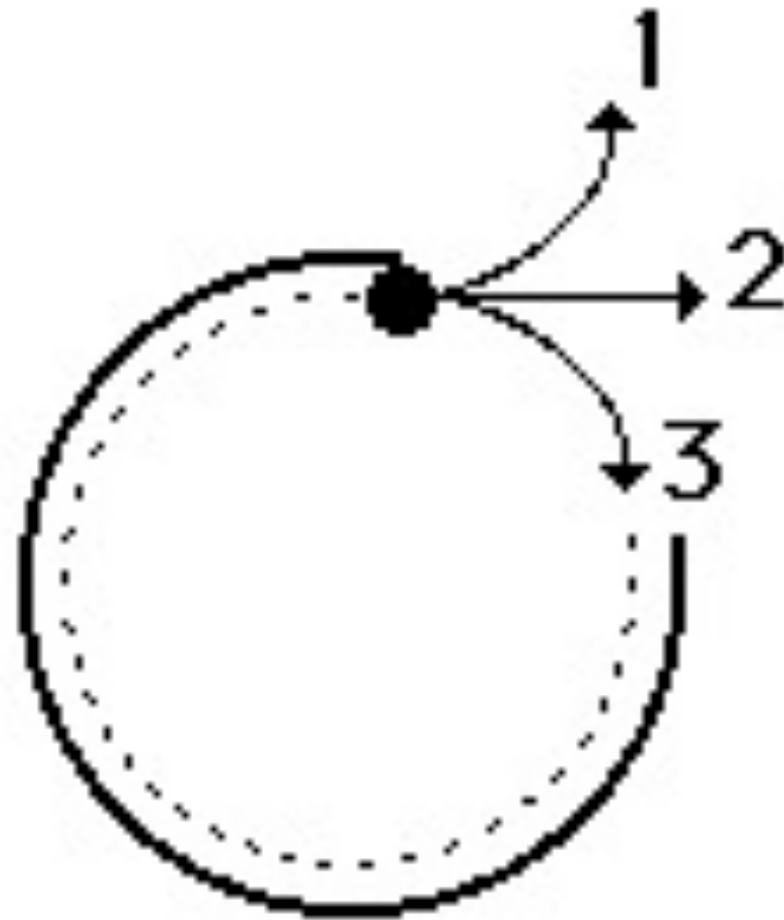
B. Air Bag

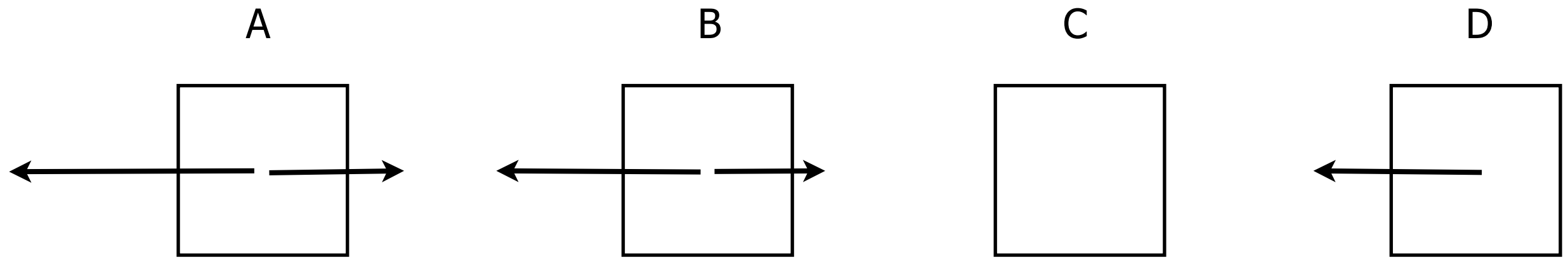
C. Seat Belt

D. Steering Wheel



In which direction will a ball travel after moving around a circular path





If a spaceship fired a cannonball into frictionless space, what diagram above shows the forces needed for the ball to remain in constant motion? (The ball is moving to the left)

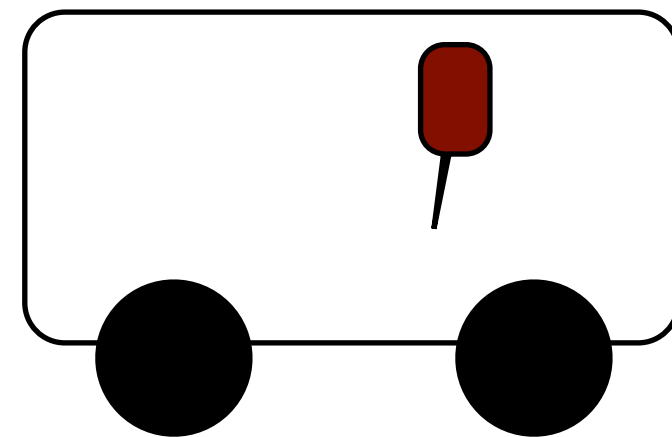
You observe a parked car with a helium balloon floating inside. When the car backs out of the parking space what is the resulting motion of the balloon?

A. Moves back with the car

B. Does not move

C. Moves forward

D. Floats upwards



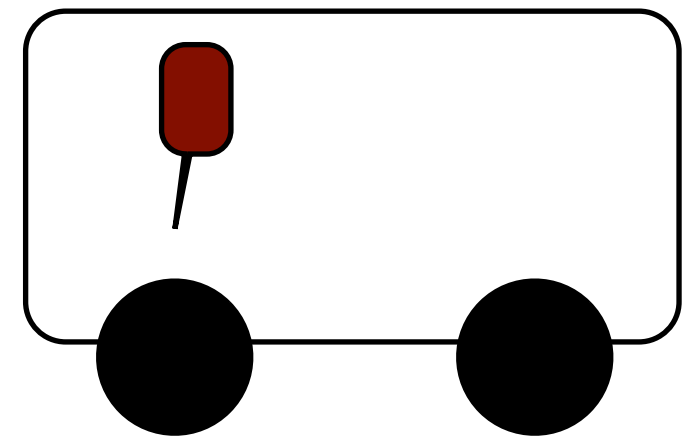
You observe a parked car with a helium balloon floating inside. When the car backs out of the parking space what is the resulting motion of the balloon?

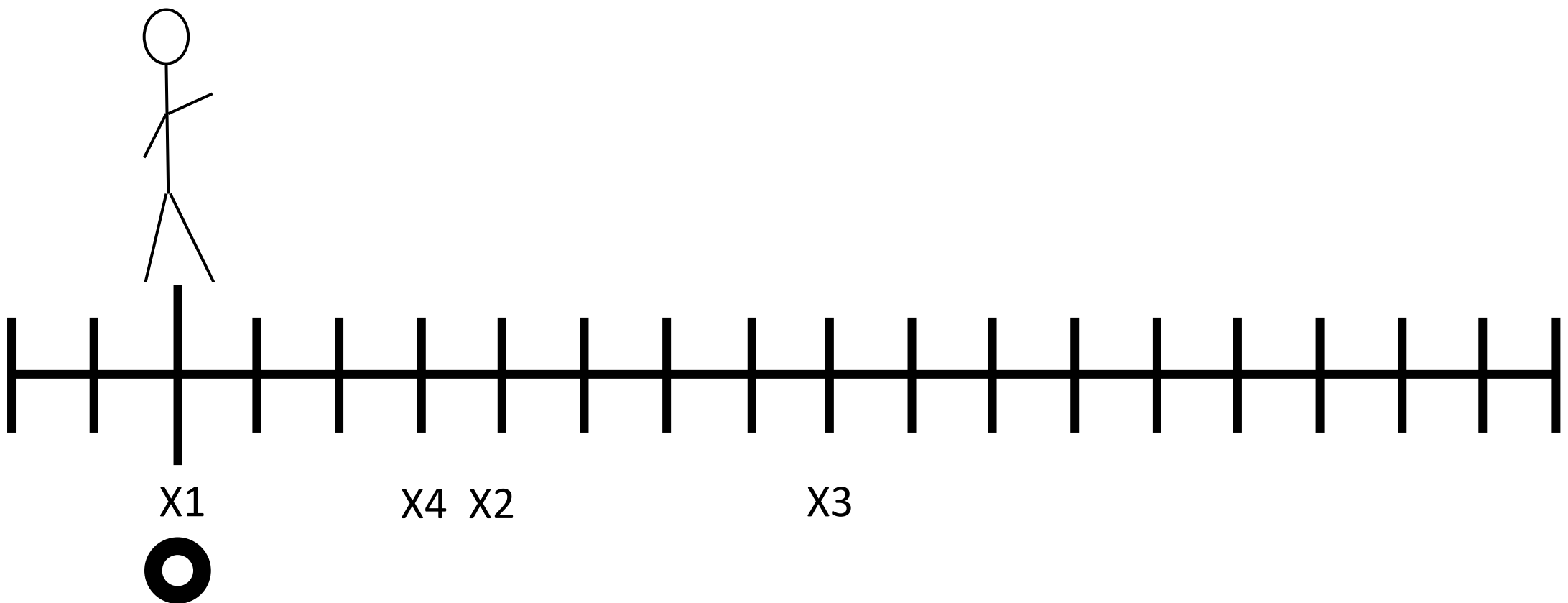
A. Moves back with the car

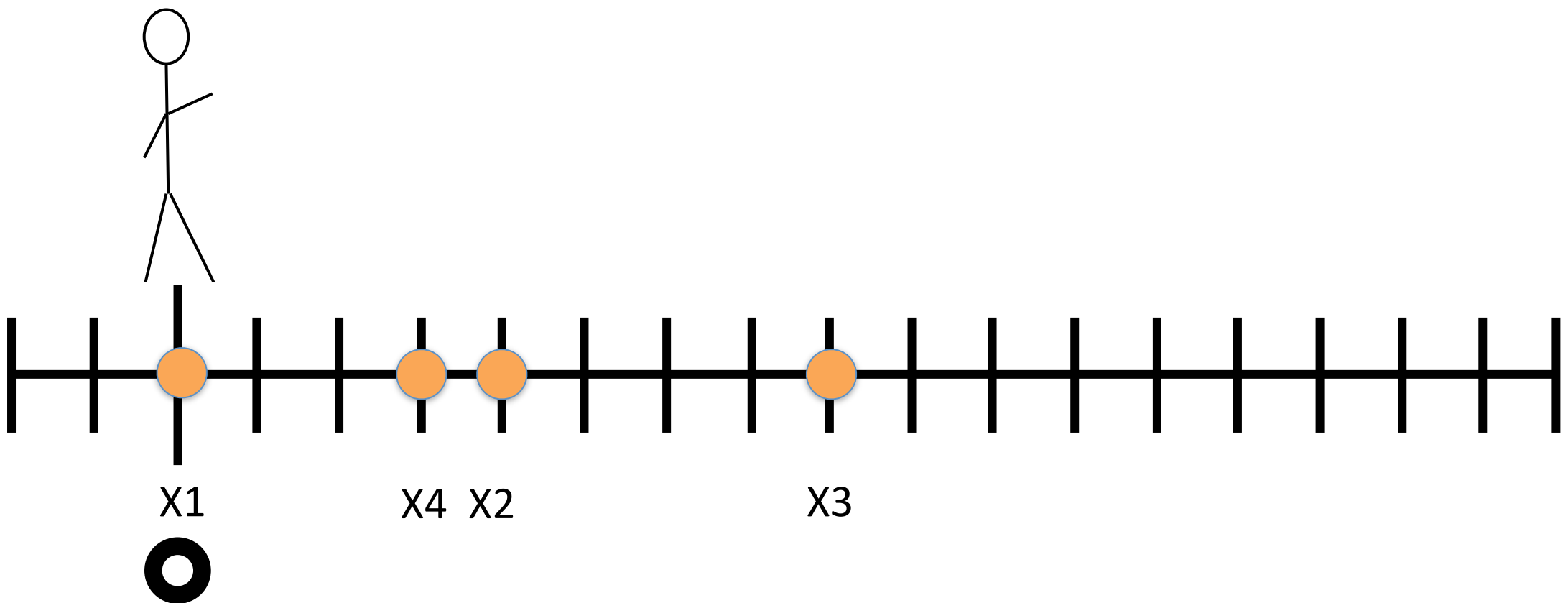
B. Does not move

C. Moves forward

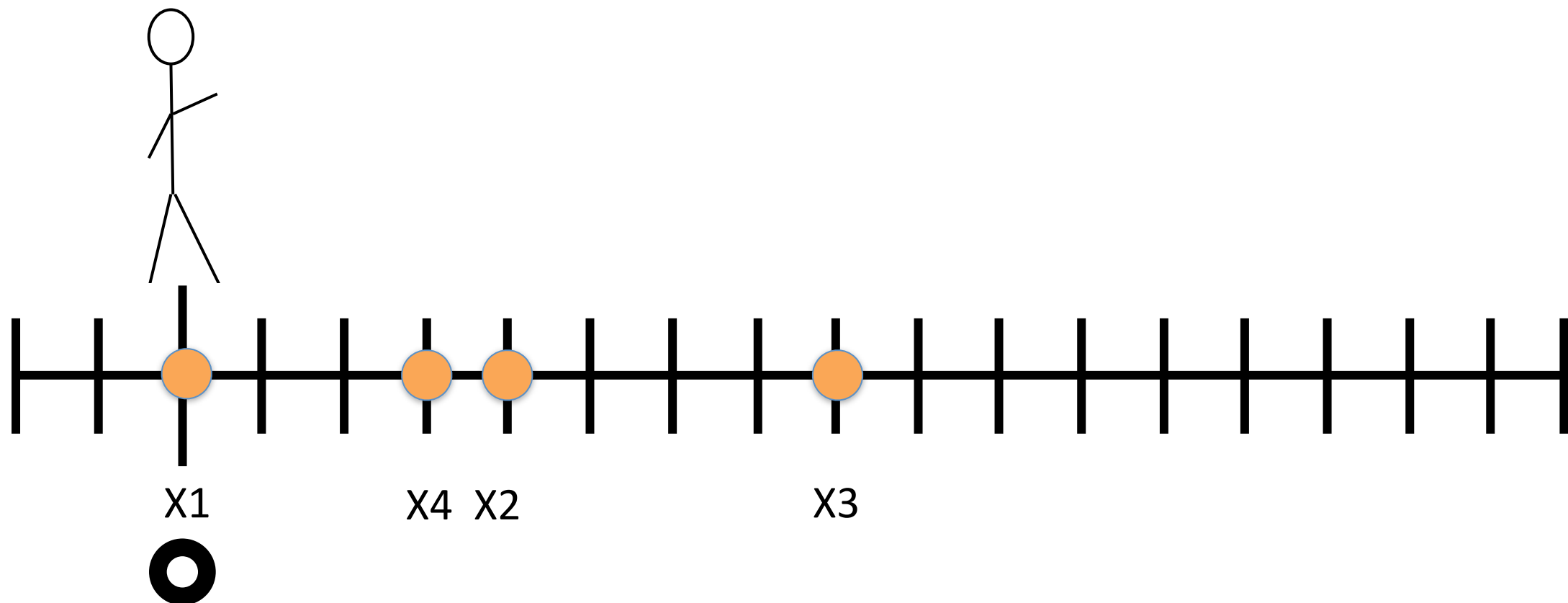
D. Floats upwards



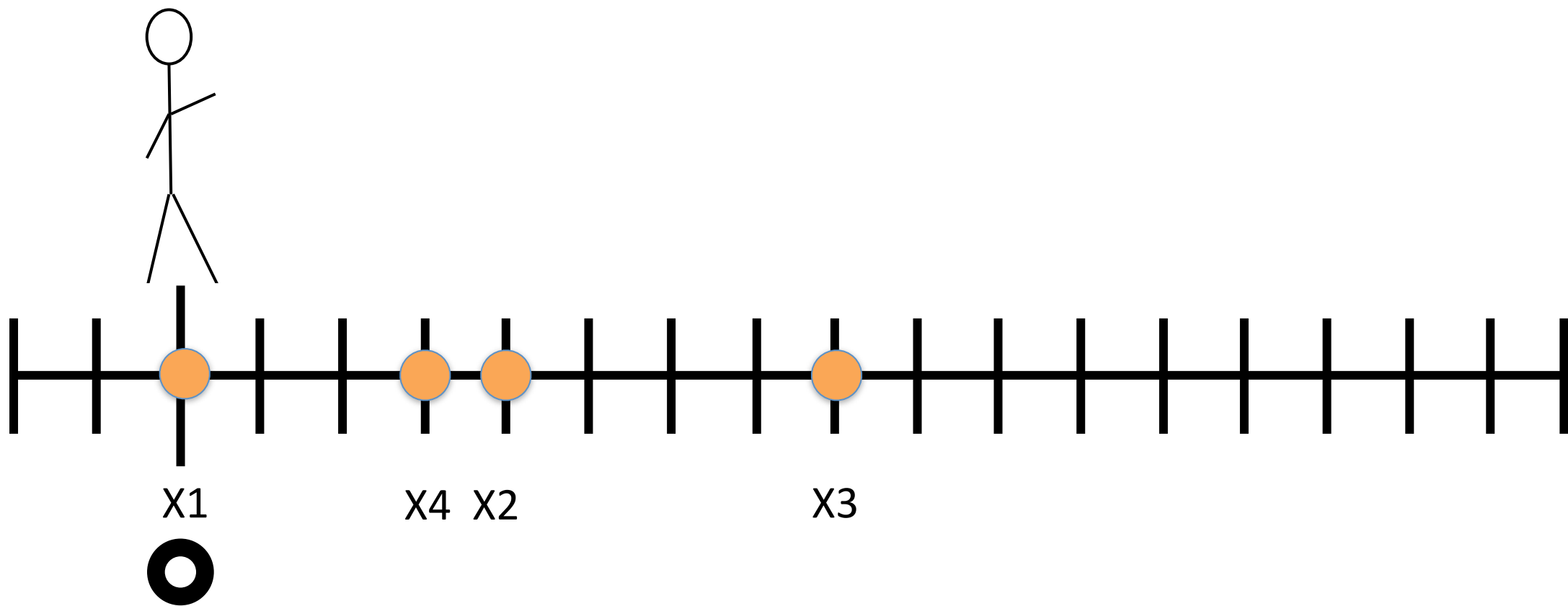




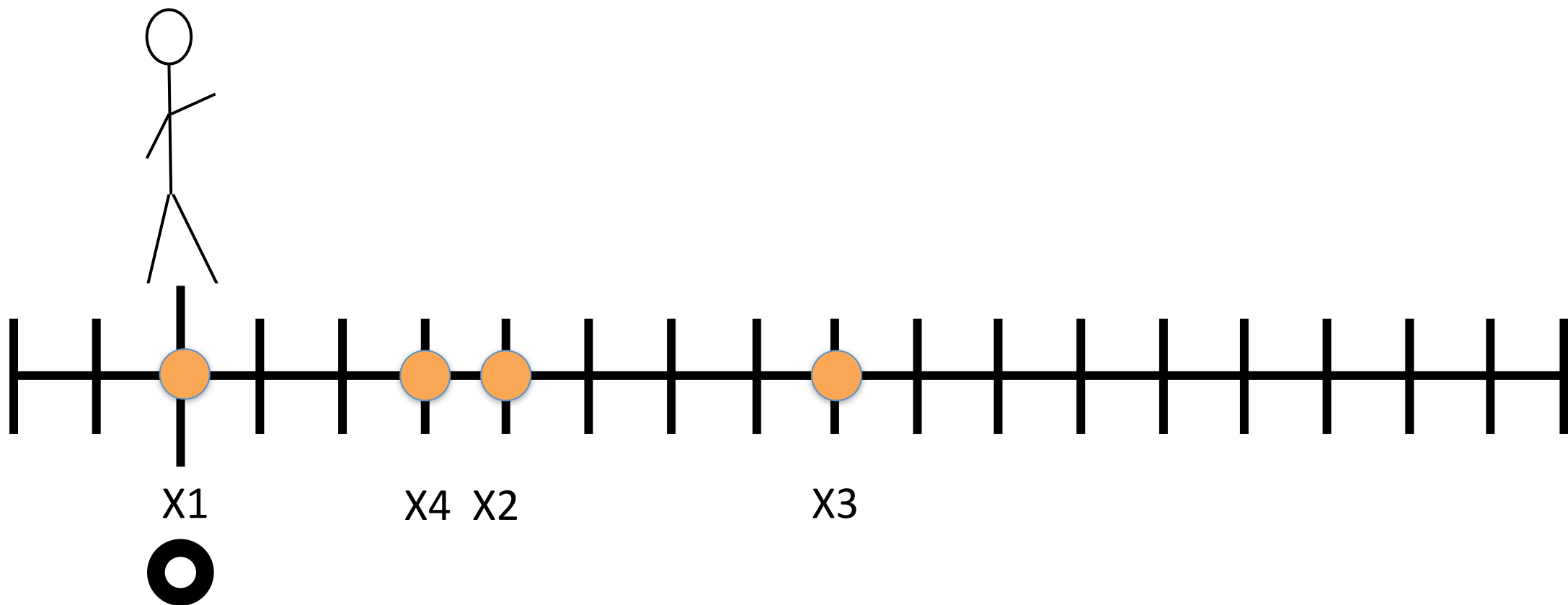
Given
$X1 = 0 \text{ m}$
$X2 = 4 \text{ m}$
$X3 = 8 \text{ m}$
$X4 = 3 \text{ m}$



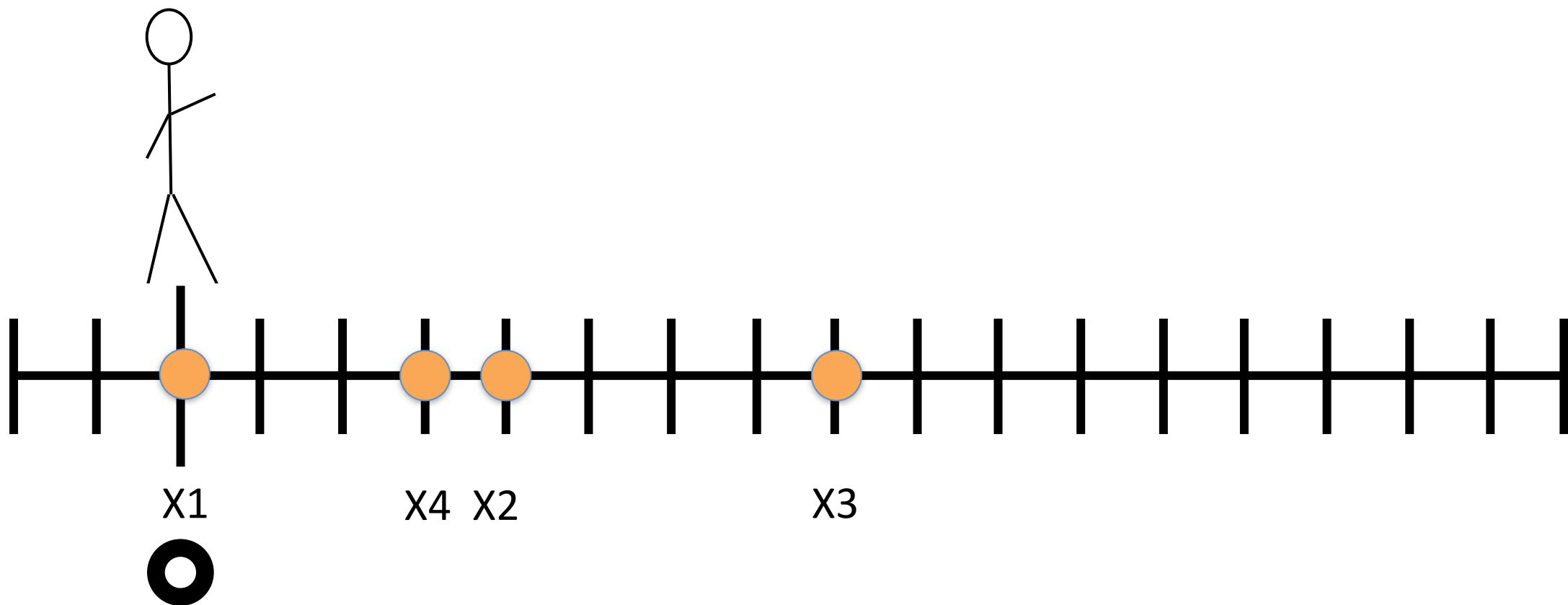
Given	
$X1 = 0 \text{ m}$	
$X2 = 4 \text{ m}$	
$X3 = 8 \text{ m}$	+
$X4 = 3 \text{ m}$	



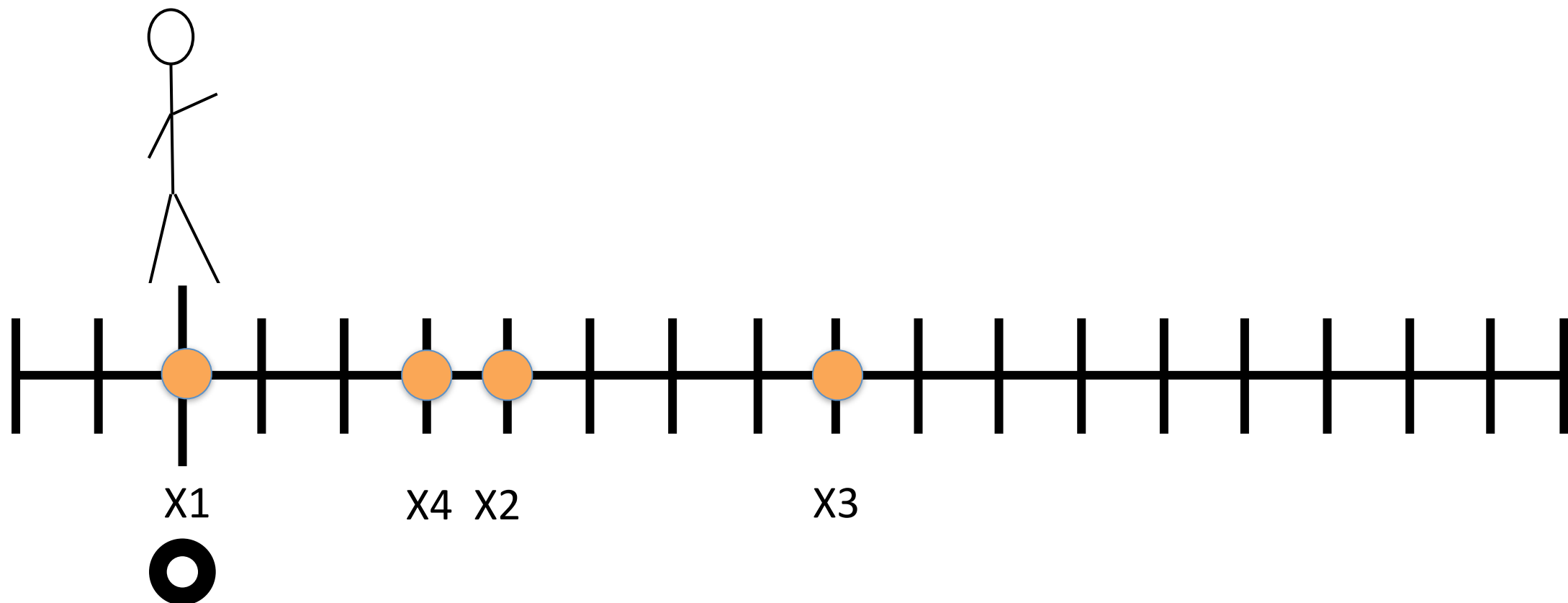
Given		distance
$X1 = 0 \text{ m}$		$d1-2 = 4 \text{ m}$
$X2 = 4 \text{ m}$		$d2-3 = 4 \text{ m}$
$X3 = 8 \text{ m}$	+	$d3-4 = 5 \text{ m}$
$X4 = 3 \text{ m}$		$dt = 13 \text{ m}$

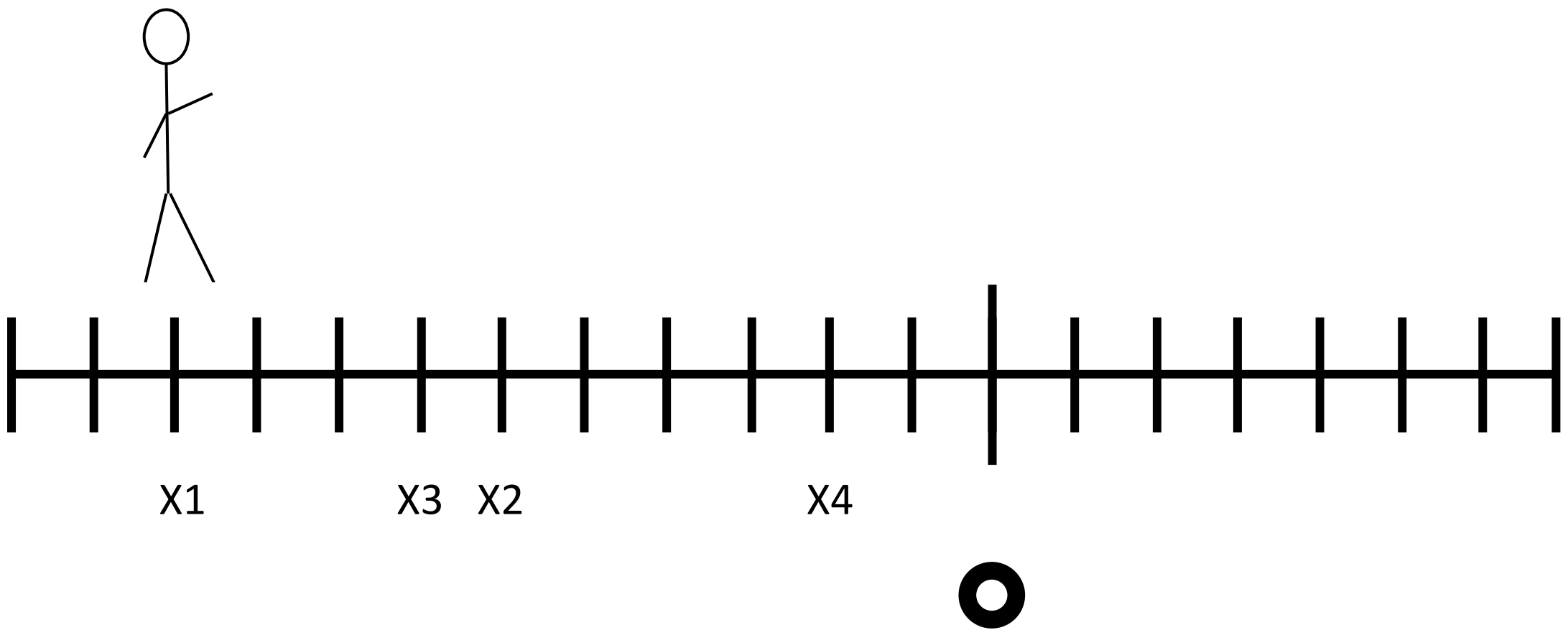


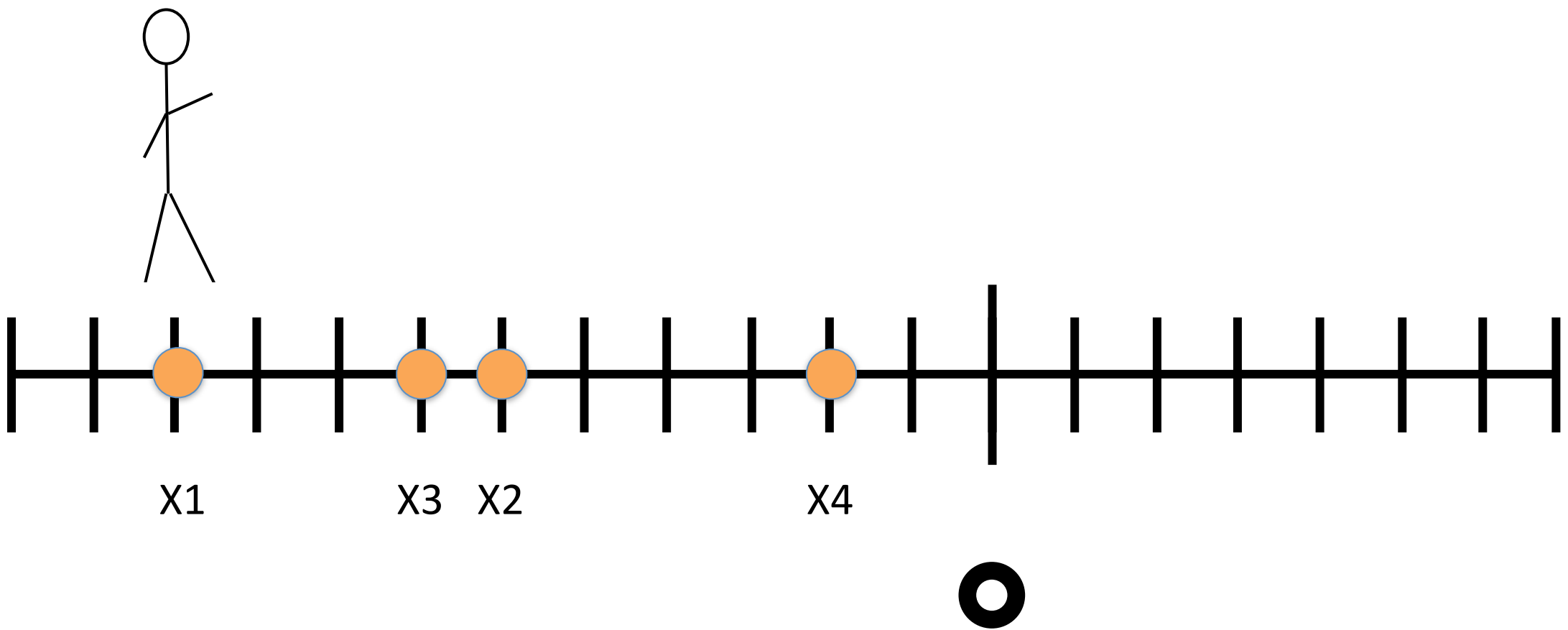
Given		distance	
$X1 = 0 \text{ m}$		$d1-2 = 4 \text{ m}$	
$X2 = 4 \text{ m}$		$d2-3 = 4 \text{ m}$	
$X3 = 8 \text{ m}$	+	$d3-4 = 5 \text{ m}$	
$X4 = 3 \text{ m}$		$dt = 13 \text{ m}$	



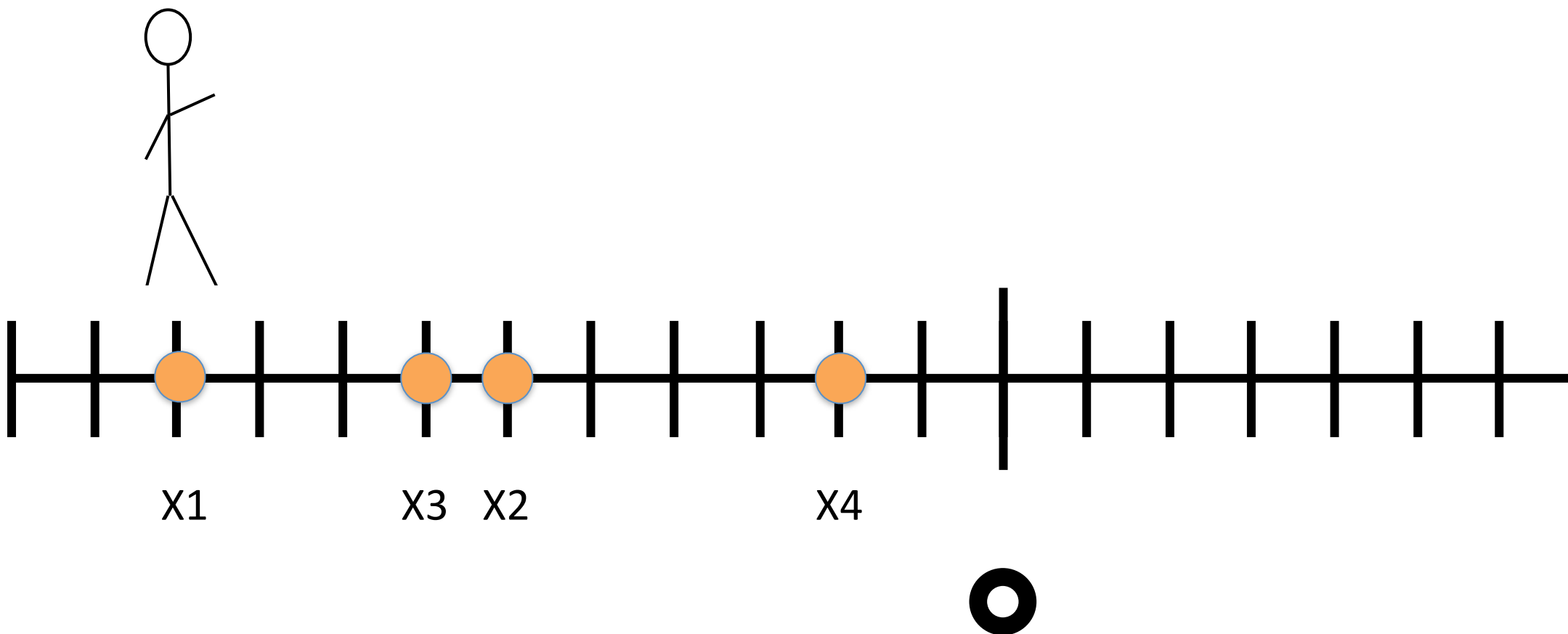
Given		distance		displacement
$X_1 = 0 \text{ m}$		$d_{1-2} = 4 \text{ m}$		$X_f = 3 \text{ m}$
$X_2 = 4 \text{ m}$		$d_{2-3} = 4 \text{ m}$		$X_i = 0 \text{ m}$
$X_3 = 8 \text{ m}$	+	$d_{3-4} = 5 \text{ m}$		$X_f - X_i = 3 - 0 =$
$X_4 = 3 \text{ m}$		$d_t = 13 \text{ m}$		3 m forward



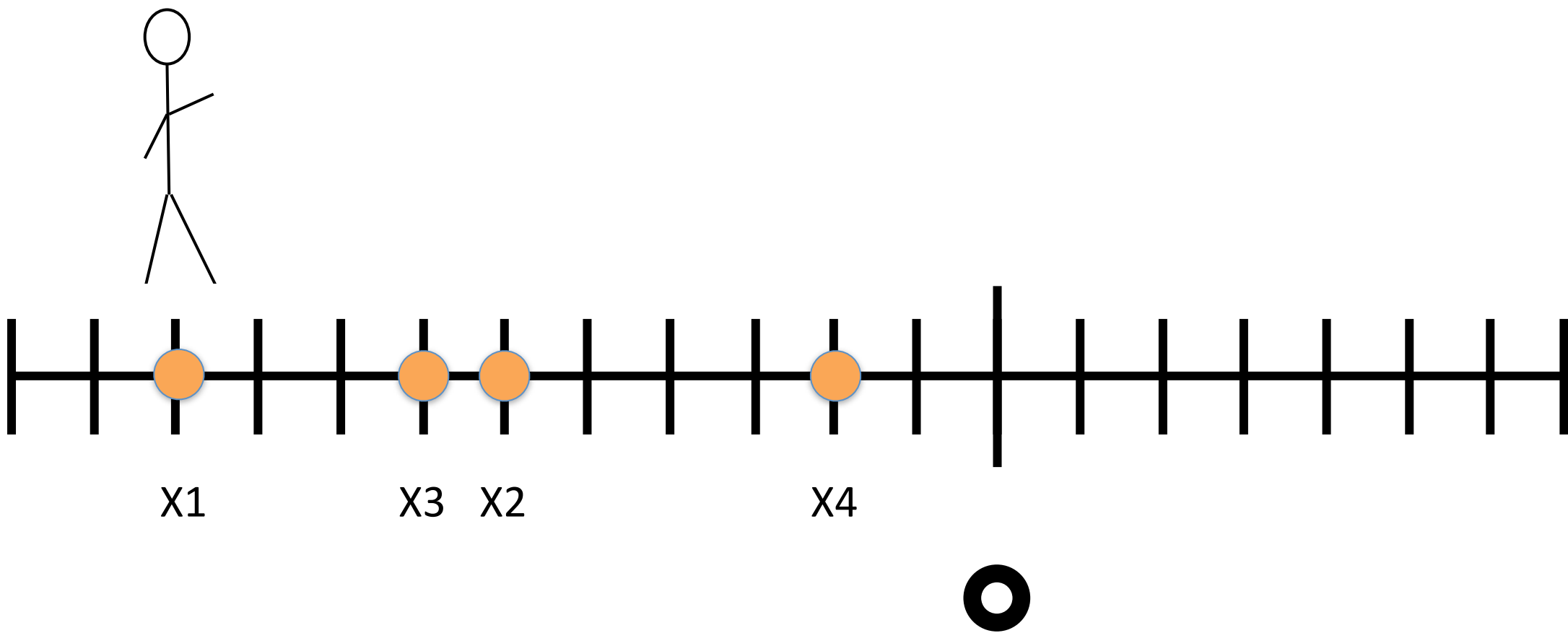




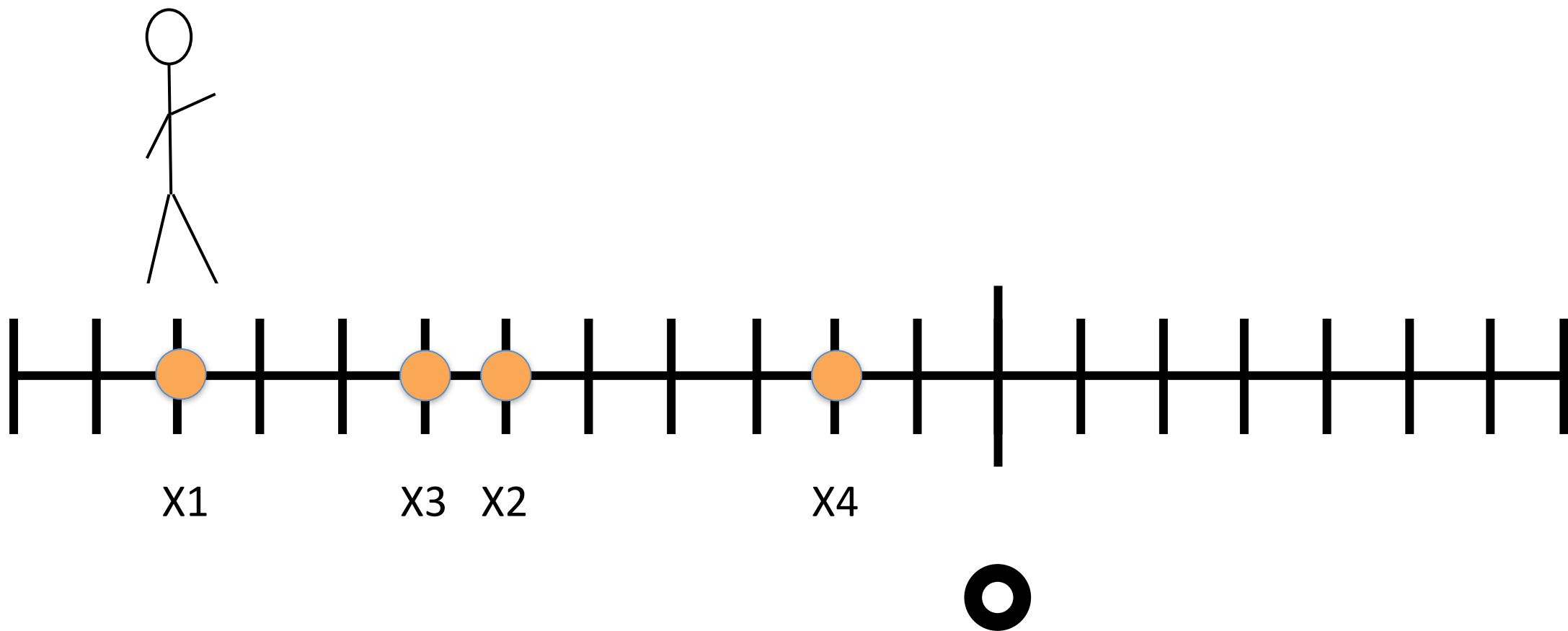
Given
$X1 = -10\text{ m}$
$X2 = -6\text{ m}$
$X3 = -7\text{ m}$
$X4 = -2\text{ m}$



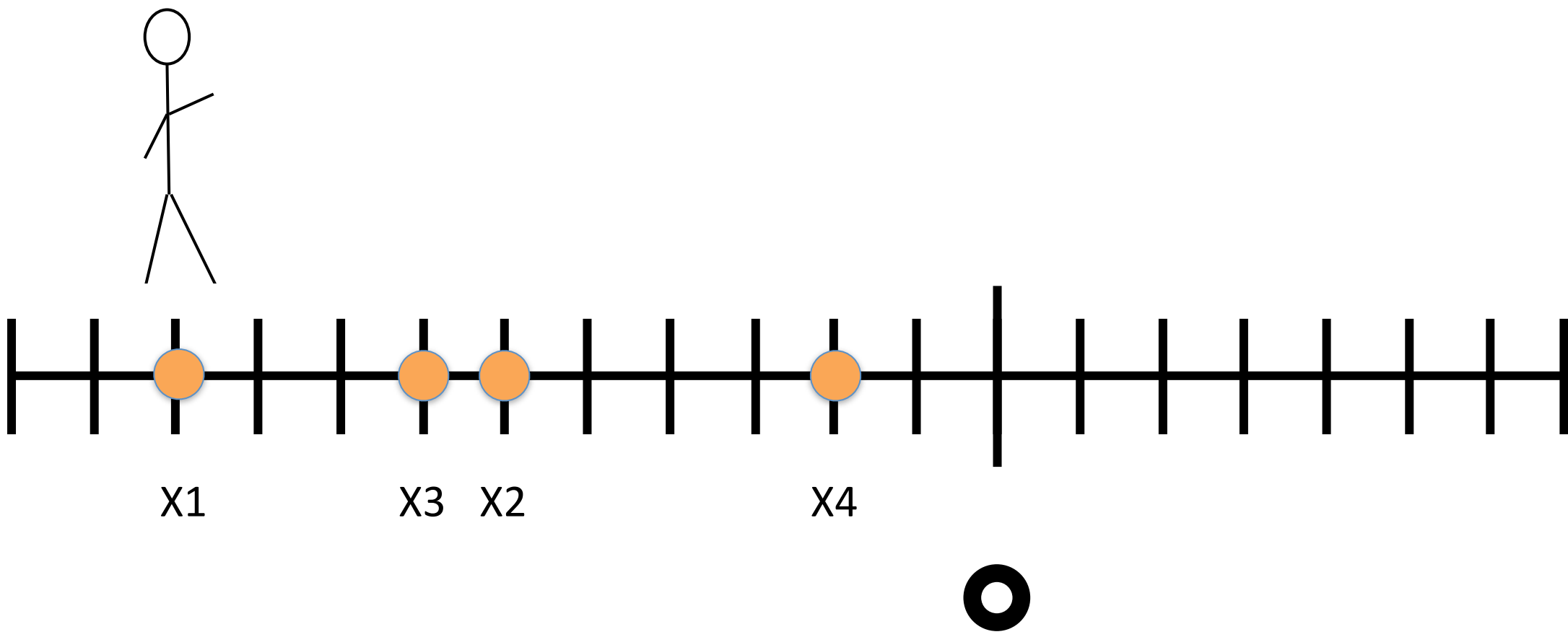
Given	
$X1 = -10\text{ m}$	
$X2 = -6\text{ m}$	
$X3 = -7\text{ m}$	+
$X4 = -2\text{ m}$	



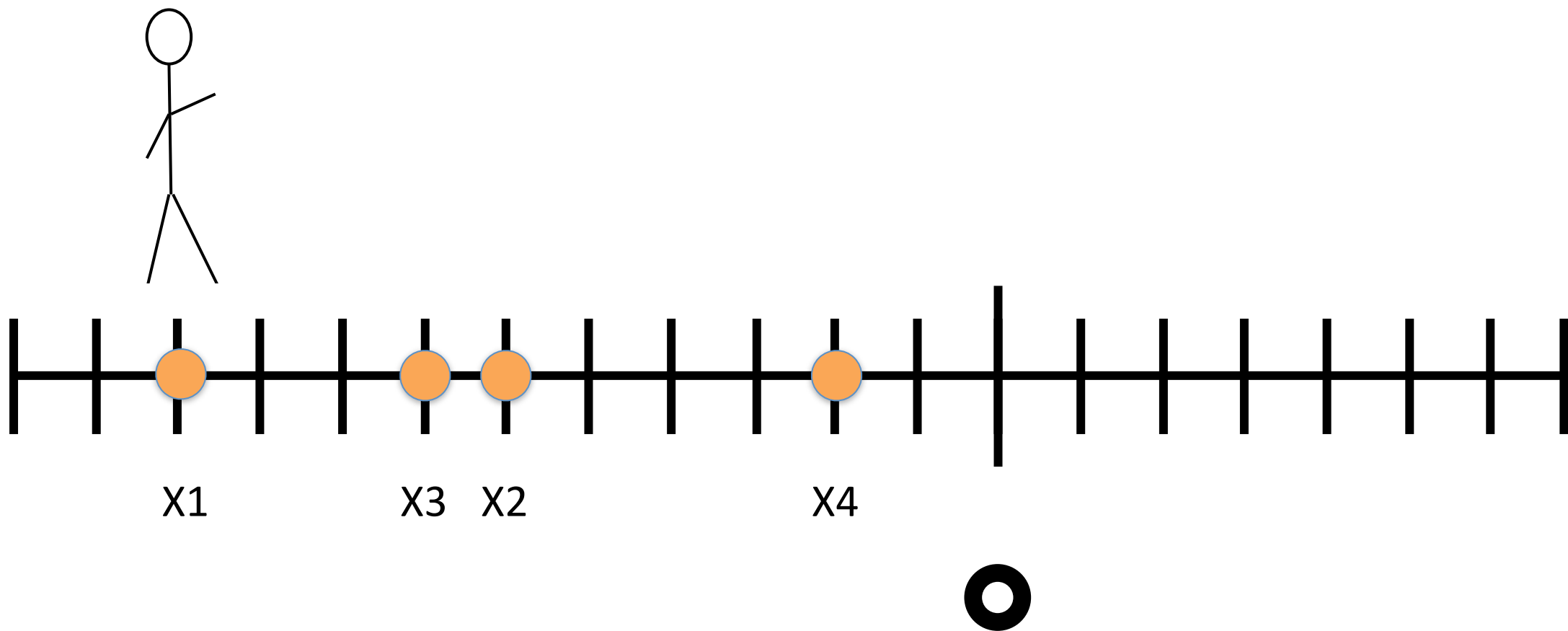
Given		distance
$X1 = -10 \text{ m}$		$d1-2 = 4 \text{ m}$
$X2 = -6 \text{ m}$		$d2-3 = 1 \text{ m}$
$X3 = -7 \text{ m}$	+	$d3-4 = 5 \text{ m}$
$X4 = -2 \text{ m}$		$dt = 10 \text{ m}$



Given		distance	
$X1 = -10 \text{ m}$		$d1-2 = 4 \text{ m}$	
$X2 = -6 \text{ m}$		$d2-3 = 1 \text{ m}$	
$X3 = -7 \text{ m}$	+	$d3-4 = 5 \text{ m}$	
$X4 = -2 \text{ m}$		$dt = 10 \text{ m}$	



Given		distance		displacement
$X_1 = -10 \text{ m}$		$d_{1-2} = 4 \text{ m}$		$X_f = -2 \text{ m}$
$X_2 = -6 \text{ m}$		$d_{2-3} = 1 \text{ m}$		$X_i = -10 \text{ m}$
$X_3 = -7 \text{ m}$	+	$d_{3-4} = 5 \text{ m}$		$X_f - X_i = -2 - -10 =$
$X_4 = -2 \text{ m}$		$d_t = 10 \text{ m}$		8 m forward



Motion – Conceptual Check

T or F: An object can be moving for 10 seconds and still have zero displacement.

True

False

If the above statement is true, describe an example of such a motion. If the above statement is false, explain why it is false.

If you travel all the way around the World what is your **DISTANCE** compared to your **DISPLACEMENT**?

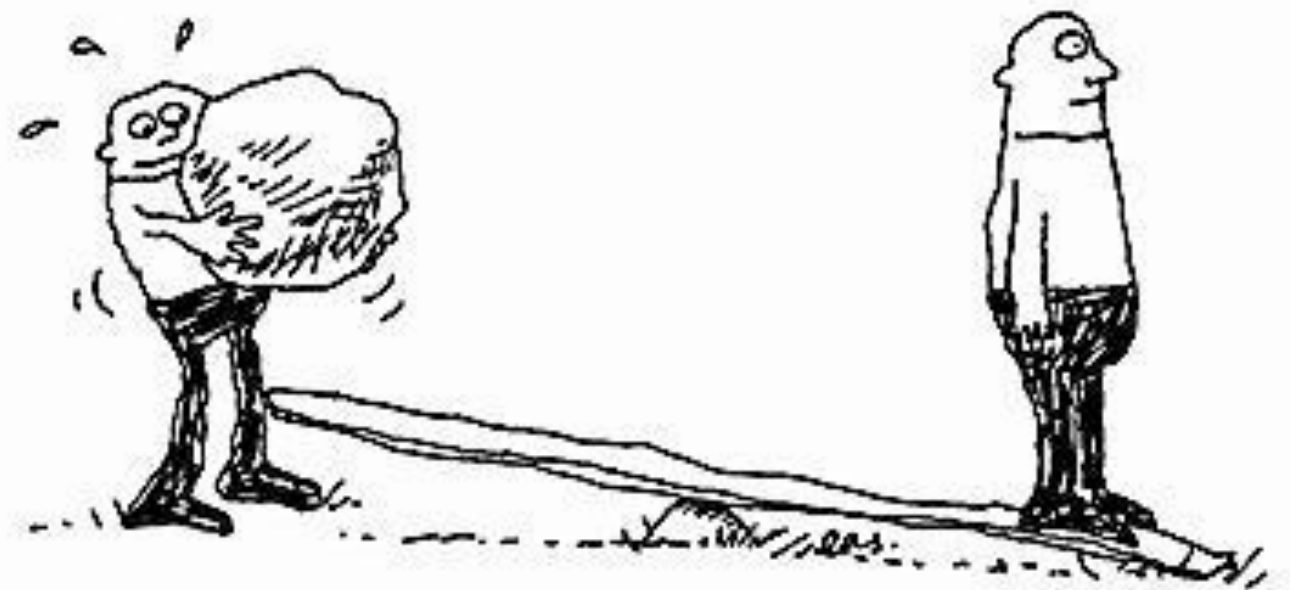
Distance ~25,000 Miles Displacement = 0



Keep in mind...

- Displacement is **NOT** always equal to the distance!
- Displacement has a **DIRECTION**
- Displacement can be positive or negative!
 - Positive or negative shows direction!!

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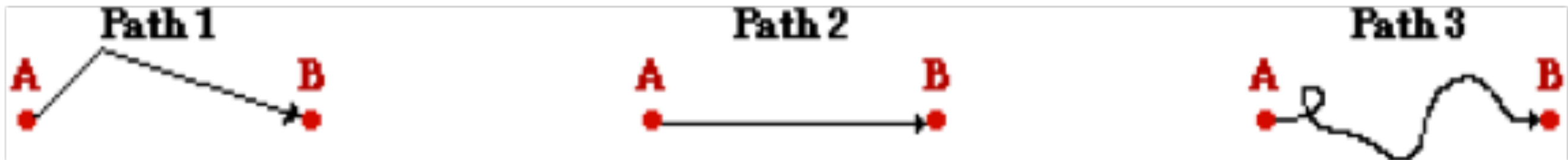


Free Long Distance

search ID: bstn44

Motion – Conceptual Check

Suppose that you run along three different paths from location A to location B. Along which path(s) would your distance traveled be different than your displacement?



Path 1 and 3

Motion – Conceptual Check

You ride your bike from your house to a friend's house that is 3 miles away. You then walk home.



What distance did you travel? 6 miles

What was the displacement for the entire trip? 0 miles